

HALACARID FAUNA OF THE GREAT BARRIER REEF AND CORAL SEA: THE GENERA *AGAUOPSIS* AND *HALACAROPSIS* (ACARINA: HALACARIDAE)

JÜRGEN C. OTTO

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Six new species of *Agauopsis* and one new species of *Halacaropsis* are described from the Great Barrier Reef Marine Park and adjacent Coral Sea reefs, namely *Agauopsis bentzei*, *A. capillosa*, *A. decorata*, *A. femeri*, *A. narinosu*, *A. ripa* and *Halacaropsis nereis*. The species *Agauopsis okinavensis* Bartsch is recorded for the first time from Australian waters, and *A. uequilivesita* Bartsch for the first time from the eastern part of the continent. The previously unknown males of *A. uequilivesita* and *A. okinavensis* are described and a key to Australian species of *Agauopsis* is presented. □ *Halacarids, Agauopsis, Halacaropsis, Great Barrier Reef, Australia.*

Jürgen C. Otto, (email: j.otto@aims.gov.au), Australian Institute of Marine Science, PMB 3, Townsville 4810, Australia; 24 February 1999

Aquatic mites of the family Halacaridae are most abundant and diverse in marine habitats but also occur freshwater and range in size from 0.1-2mm. They are unable to swim and are therefore part of the benthos. More than 900 species have been described to date. Until a few years ago relatively few species were described from Australia and these were the result of sporadic collecting at just a few localities (Otto, 1994). However, recently 88 species of halacarid mites were found around the relatively small Rottneest Island (Western Australia) after only 14 days of collecting activity, which led to a dramatic increase in the number of described Australian species (Bartsch, 1992a,d; 1993a,b,c,d; 1994a,b; 1996a,b; 1997a,c; for an accurate account of all halacaroids described until 1998 see Haliday, 1998).

On the basis of such figures it appears likely that the species presently known from Australia represent only a fraction of those that inhabit the coastal waters of this continent. Further studies on Australia's extensive coast are necessary to reveal the full extent of halacarid diversity on this continent. In particular, the tropical north of the continent has barely been investigated in regard to its halacarid fauna, the only records being of 4 species of *Copidognathus* found in Darwin Harbour (Bartsch, 1997b) and 1 species of *Copidognathus* collected on the Great Barrier Reef (GBR) (Bartsch, 1996c).

The present study forms part of a project aimed at investigating the halacarid fauna of Australia's GBR, adjacent coast and Coral Sea reefs. Among the halacarids found to date are 8 species of

Agauopsis and 1 species of the closely-related genus *Halacaropsis*. Seven of these are new to science and are described herein.

METHODS

Sand, coral rubble and algae, all substrates in which halacarids are known to occur, were collected by hand either intertidally or from various depths usually using SCUBA. A single sample from 51m depth was taken by a mechanical grabbing device. Mites were extracted by washing the substrates in a bowl of water and decanting the supernatant through a 100µm sieve. All material was collected by the author except where stated otherwise. Mites were cleared in lactic acid and mounted in PVA (Boudreaux & Dosse, 1963). Drawings were made with the aid of a camera lucida.

In the accounts of each species only one sex is described in detail, while for the opposite sex only characters that differ are described. Measurements are in micrometres (µm). Terminology follows Bartsch (1993e) and includes: areolae – areas on dorsal and ventral plates with cuticular structure differing from remainder of plates; eostae – longitudinal areolae on PD and AD; parambulacral setae – small setae at tip of tarsus; cornea – refractile body visible on the ocular plate in deeper cuticular layers. Abbreviations: AD, anterodorsal plate; AE, anterior epimeral plate; GA, genitoanal plate; GO, genital opening; OC, ocular plate; PD, posterodorsal plate; PE, posterior epimeral plate; P-2, P-3, P-4, 2nd, 3rd and 4th palp segments (starting from base); I-IV,

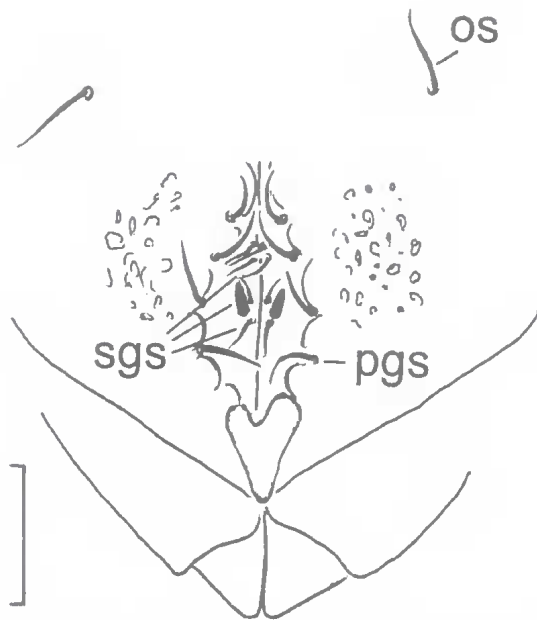


FIG. 1. *Agauopsis aequilivestita* Bartsch, male genital opening. Scale line = 25µm.

leg I to leg IV; ar, areola; co, costa; pas, single parambulacral setae; double-pas, doubled parambulacral setae; os, outlying setae; pgs, perigenital setae; sgs, subgenital setae. All material is deposited in the Queensland Museum (QM), at the Museum of Tropical Queensland branch in Townsville (MTQ), unless stated otherwise. Abbreviations for other depositories: ANIC, Australian National Insect Collection (Canberra, Australia); UQIC, University of Queensland Insect Collection (Brisbane, Australia); ZMH, Zoologisches Museum Hamburg (Hamburg, Germany).

SYSTEMATICS

Agauopsis Viets

Agauopsis Viets, 1927: 94; 1956: 687. Newell, 1947: 21, 38, 184; 1971: 28; 1984: 215. Bartsch, 1986: 165; 1993e: 57; 1996a: 2; Otto, 1994: 35.

TYPE SPECIES. *Agave brevipalpus* Trouessart, 1889b, by original designation.

DIAGNOSIS. Body heavily armoured; setae on dorsal striated integument not distinctly longer than setae on dorsal plates. Anterior epimeral plate entire, with 3 pairs of setae. Leg I heavier than legs II-IV, with heavy spiniform setae on telofemur, genu, tibia and tarsus. Spine on tarsus I in medial position, much shorter than tarsus.

Tarsi straight, not curved. Median claws absent or inconspicuous. Tarsi III and IV usually lacking ventral setae (parambulacral setae excluded).

Agauopsis aequilivestita Bartsch (Fig. 1)

Agauopsis aequilivestita Bartsch, 1996a: 2.

MATERIAL. Great Barrier Reef Marine Park; QMS105141, F, and ZMH, F, 19.20.12°S 149.02.85°E, Elizabeth Reef, 25. Dec. 1997, coarse sand at 3m; QMS105142-105144 3F, 18.25.93°S 147.21.11°E, Faraday Reef, 13 Apr. 1998, coarse sand & rubble at 10m, sand at 2m, and coarse sand & rubble at 2m, respectively; QMS105145, F, 18.41.91°S 147.06.49°E, Loadstone Reef, 12 Apr. 1998, sand & rubble at 2m; QMS105146, F, Carter Reef, ca. 14.32°S 145.35°E, 11 Oct. 1998, coarse sand at 0.5m. Coral Sea: QMS105147-105153, 7F, ANIC, F, ZMH, F; QMS105154-105159, 6F, Lihou Reef, ca. 17.25°S 151.40°E, 20-22 July 1998, D. Fenner, sand at 5-7m; QMS105160, F, Willis Islet, ca. 16.18°S 149.58°E, 15 Sept. 1998, G.A. Diaz-Pulido, coral rubble (fine), 0-10m.

REMARKS. The above listed specimens are the first records of this species from the Australian east coast. The species was known previously only from Rottnest I. in SW Australia. It is closely related to *Agauopsis punctatus* Bartsch, 1981, from the Moçambique channel.

Bartsch (1996a) described an oblong area lacking rosette pores on the posterodorsal plate of *A. aequilivestita*. Such an oblong area is absent in all specimens from the Coral Sea reefs but present, although variable in size and sometimes barely visible, in all specimens collected on the GBR. These differences could indicate that Coral Sea and GBR populations are reproductively isolated and as a result may have diverged over time. The reefs of the Coral Sea are separated from the GBR by a >1,000m deep trench which may constitute a significant barrier for halacarids that lack planktonic life stages.

The present material contains previously unknown males which differ from the female as follows: Idiosoma 372-400 long. 8-14 pgs surrounding GO, inserted between cuticular callocities (Fig. 1); pair of outlying setae inserted anterolateral to GO. GO with 5 pairs sgs, 2 pairs anterior and 3 pairs posterior, the middle pair of the posterior group much heavier than the others. Cuticle surrounding GO with irregular shaped pits.

***Agauopsis benziei* sp. nov.**
(Figs 2, 3)

ETYMOLOGY. In honour of Dr John Benzie who has given his continuous support for the present project.

MATERIAL. HOLOTYPE: QMS105161, F, Great Barrier Reef Marine Park, Elizabeth Reef, 19°20.12'S 149°02.85'E, 25 Dec. 1997, coarse sand at 3m. PARATYPES: Great Barrier Reef Marine Park: QMS105162, F, ZMH, F, Elizabeth Reef 19°20.12'S 149°02.85'E, 25 Dec. 1997, coarse sand and rubble at 3m; QMS105164, F, Bramble Reef, 18°25.25'S 146°40.65'E, 10 Apr. 1998, medium coarse sand at 3-6m; QMS105163, F, Bramble Reef, 18°25.25'S 146°40.65'E, 10 Apr. 1998, chunks of coral rubble at 3-6m; ANIC, F, Loadstone Reef, 18°42.03'S 147°06.54'E, 12 Apr. 1998, coarse sand & rubble at 12-15m; QMS105165-105166, 2F, Pandora Reef, 18°49'S 146°26'E, 22 Jan. 1997, coarse sand at 1m; QMS105175, F, QMS105167 M, between Myrmidon Reef and Faraday Reef, 18°23.64'S 147°20.42'E, 13 Apr. 1998, fine-medium coarse sand, at 51m; QMS105169, M, Rosser Reef, ca. 15°37'S 145°33'E, 8 Oct. 1998, sand at 2m; QMS105174, F, No Name Reef, ca. 14°39'S 145°40'E, 9 Oct. 1998, chunky coral rubble & sand at 9m; QMS105170, F, Yonge Reef, ca. 14°36'S 145°38'E, 20 Sept. 1998, G. Diaz, medium coarse sand at 7m. Coral Sea: QMS105171, M, Lihou Reef NW, ca. 17°25'S 151°40'E, 22 July 1998, D. Fenner, sand at 8m; QMS105168, M, South Willis Islet, ca. 16°18'S 149°58'E, 15 Sept. 1998, G.A. Diaz-Pulido coll., coral rubble (fine), 0-10m; QMS105173, F, QMS105172, M, Chilcott Islet, 16°56.51'S 150°0.4'E, 14 Sept. 1998, G.A. Diaz-Pulido coll., coarse sand, 1-14m.

Female. Idiosoma 412-470 long (holotype 443). AD and PD closely associated (Fig. 2A); no setae in membranous cuticle between them. Frontal spine stout, roughened and medially notched. AD posteriorly narrowing, truncate; areola shaped as in Fig. 2A, marked by double row of deep pits and numerous fine canaliculi in deeper cuticular layers; transverse part of areola set off sharply from anterior part of plate; part of plate circumscribed by areola with thick cuticular bars forming conspicuous reticulate ornamentation, floor of each polygon roughened by shallow pits; rest of plate papillate; with a pair of setae inserted directly anterior to areola. OC with 2 corneae and transverse areola (marked by pits and in deeper cuticular layers by numerous canaliculi) on elevated part of plate; posterior to corneae with pore, anteriorly with a seta; anterior and posterior parts of plate papillate. PD with pair of prominently elevated costae, marked by double row of deep pits and in deeper cuticular layers by numerous canaliculi; costa over most of its length 2 pits wide, posteriorly swollen and about 3-4 pits wide; remainder of plate conspicuously reticulated; 2 pairs of setae near anterolateral

margin of plate, 3rd pair of setae approximately half way along plate. Pair of adanal setae inserted dorsally on reticulated anal cone. AE with very faint reticulate ornamentation; pierced by canaliculi, those directly posterior to the anterior and posterior pairs of epimeral setae and posterior to the pair of epimeral pores slightly coarser than canaliculi on rest of plate; posterior margin with series of pore-like structures (Fig. 2B). PE dorsally with 3 pitted areolae, lateral to dorsal seta, just posterior to dorsal seta and anterior to insertion of leg IV, respectively (Fig. 2A); ventrally with 3-4 areolae, of which the posterior one is marked by relatively deep pits while the others are marked by fine canaliculi. GA punctate and very faintly reticulate; few pore-like markings in anterior half of plate along lateral margins (Fig. 2B); anterolateral to GO with pitted areolae; cuticle posterolateral to GO thickened and roughened; position of 3 pairs of pgs as in Fig. 2B, anterior pair well removed from anterior end of GO.

Ventral gnathosomal base with conspicuous lateral protrusion (Fig. 2D); distinctly pitted throughout, most conspicuously on protrusion; pair of setae separated by <1/5th of width of gnathosomal base. Dorsal gnathosomal base roughened. Rostrum longer than gnathosomal base; rostral sulcus extending along 2/3rd of rostrum. Medial spine on P-3 slender and tapering; P-4 with 2 slender setae inserted half way along segment, one shorter than the other.

Telofemora and tibiae of legs with reticulate ornamentation, most conspicuous on medial flanks (indicated for leg I in Fig. 3A). Telofemur I with a sharp ventral ridge carrying a proximal protuberance, dorsally with a series of conspicuous pits. Chaetotaxy (trochanter-tibia): I 1-2-9(10)-5-11 (Fig. 3A); II 1-2-7-4-8 (Fig. 3B); III 1-2-4-3-6 (Fig. 3C); IV 1-2-4-3-6 (Fig. 3D). Leg I with the following complement of heavy spiniform setae: 1 ventral and 3 medial on telofemur, 1 medial on genu, 3 medial and 2 ventral on tibia, 1 medial on tarsus; 2 of the 3 medial spiniform setae on tibia closely associated (Fig. 3A). Tibia II with 3 spiniform apically denticulate setae, the 2 distal ones longer than the proximal one (Fig. 3B). Tibiae III and IV with 2 such setae, proximal one much shorter than distal one (Fig. 3C,D). Tarsus I with pair of pas, pair of double-pas, and 1 ventral seta. Tarsus II with pair of double-pas, ventral member spur-like. Tarsi III and IV with 1 ventral seta and pair of pas, the lateral pas spur-like. Paired claws on tarsus I

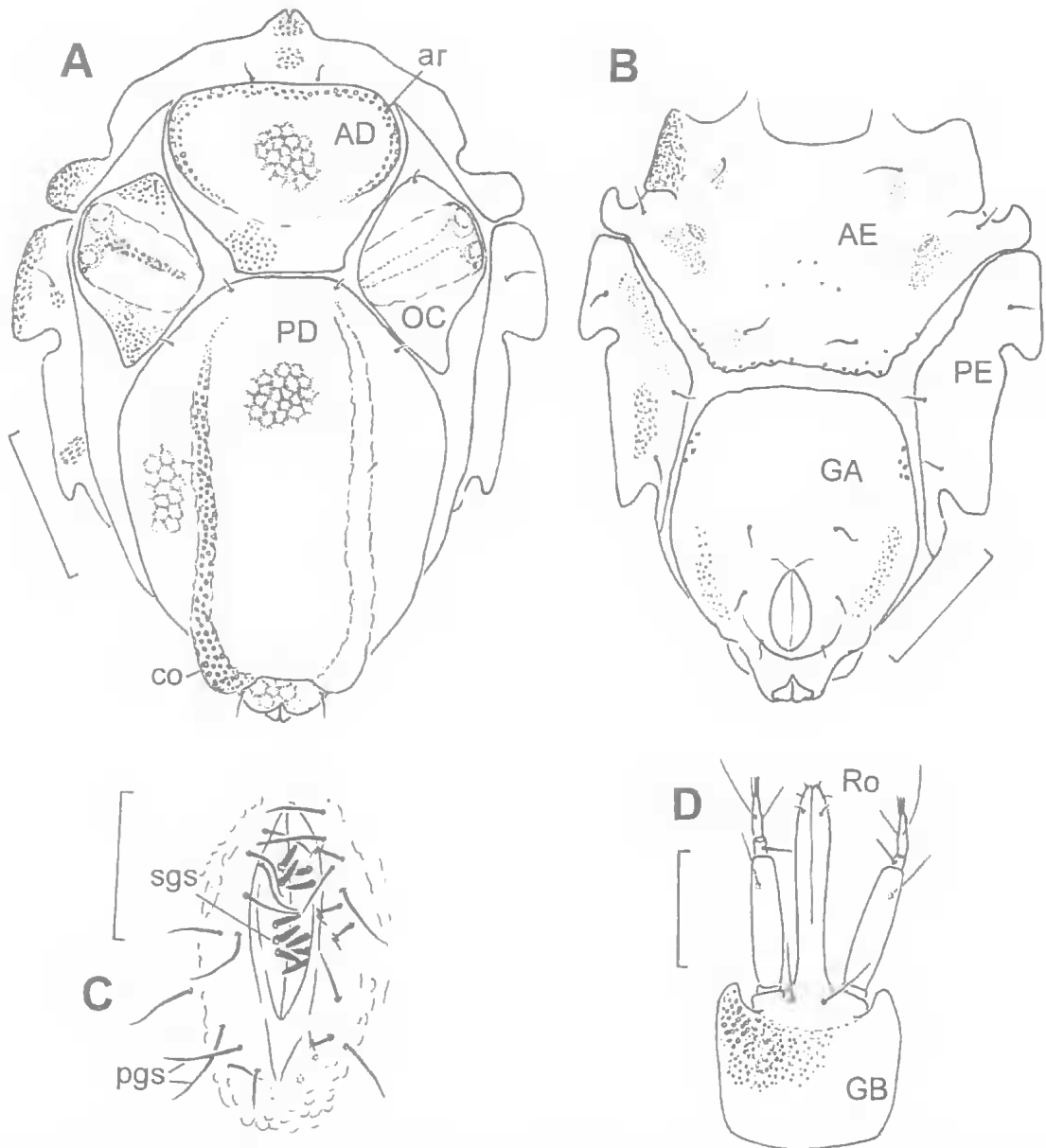


FIG. 2. *Agauopsis benziei* sp. nov., adult: A, dorsal idiosoma of female; B, ventral idiosoma of female; C, genital opening of male; D, ventral gnathosoma. Scale lines: A,B = 100 μ m; C = 25 μ m; D = 50 μ m

smooth, those of other legs with accessory process and pecten. All tarsi with median claw.

Male. Idiosoma 399-448 long. GO surrounded by ca. 22-24 pgs (Fig. 2C); genital valve with 5 pairs of sgs, 2 pairs anteriorly and 3 pairs posteriorly.

REMARKS. *Agauopsis benziei* sp. nov. differs from all its congeners by the shape of the areola on the anterodorsal plate. In *A. benziei* it is a

narrow band in the shape of an inverted bowl. *A. benziei* is a typical representative of the *conjuncta* group (see Bartsch, 1986) which is characterised by the costae on the posterodorsal plate carrying relatively deep pits, the anterodorsal plate narrowing posteriorly and tibia I possessing five spines. The other species in this group are *A. bathyalis* Bartsch, 1989, *A.*

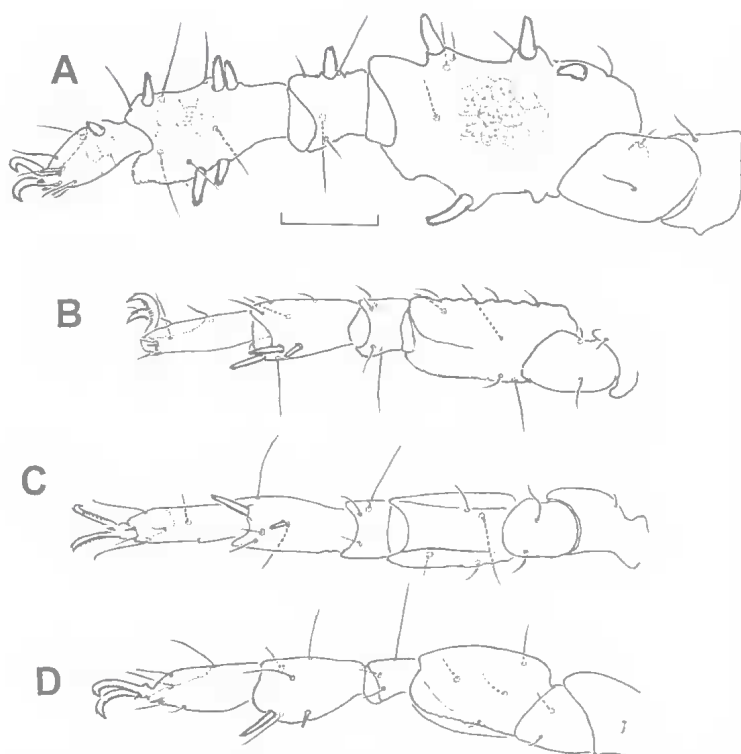


FIG. 3. *Agauopsis benziei* sp. nov., adult: A, leg I, ventromedial; B, leg II, ventromedial; C, leg III, ventral; D, leg IV, lateral. Scale lines = 50µm.

conjuncta Viets, 1940, *A. meteoris* Bartsch, 1973, and *A. minor* (Trouessart, 1894).

***Agauopsis capillosa* sp. nov.**
(Figs 4,5)

ETYMOLOGY. Latin, *capillosa* = hairy; referring to the numerous fine filaments on the leg setae.

MATERIAL. HOLOTYPE: QMS105176, F, Great Barrier Reef Marine Park, Phillips Reef, 18°58.49'S 146°36.94'E, 16 Apr. 1998, muddy rubble at 12m. PARATYPE: QMS105177, F, Great Barrier Reef Marine Park, Elizabeth Reef, 19°20.12'S 149°02.85'E, 25 Dec. 1997, coral rubble at 10m.

Female. Idiosoma in holotype and paratype 410 long. Membranous cuticle with 1 pair of setae near posterolateral margin of AD (Fig. 4C). AD with prominent frontal spine ornamented with few slightly raised panels; lateral to frontal spine with pair of protuberances; lateral part of plate with pair of areolae consisting of a single row of quadrangular panels, each panel associated with an alveolus in deeper cuticular layers; panels roughened by minute tubercles, not pierced by canaliculi; between areolae with reticulate

ornamentation formed by cuticular bars surrounding pitted polygons. OC acuminate posteriorly, punctate and faintly reticulate; with 2 corneae and posterior to these with a pore; transverse areola inconspicuous, only represented by a few solid panels. PD with reticulate ornamentation similar to that on AD; pair of narrow raised costae (consisting of a single row of quadrangular panels overlying alveoli) strongly converging posteriorly; 3 pairs of setae as illustrated (Fig. 4C); posteriorly with pair of pores. AE not extending beyond insertion of legs III; posterior margin slightly concave (Fig. 4A); punctate and with inconspicuous reticulate ornamentation throughout; posterior to insertions of legs I and II with papillate areolae; half way along plate on either side with group of several scars continuing underneath surface as sickle-shaped selerites. PE

punctate, laterally with papillate areolae. GA punctate; 3 pairs of pgs, the anteriormost pair heavier than the others; lateral to GO with papillate areolae.

Ventral gnathosomal base swollen posterolaterally; punctate; laterally with reticulate ornamentation (Fig. 4B); pair of setae inserted at distance <1/3rd of width of gnathosomal base. Rostrum longer than gnathosomal base. Palp longer than rostrum; P-3 with slender and tapering spine which is at least twice as long as P-3; P-4 subequal in length to P-2, with 2 fine tapering setae and 2 shorter blunt setae apically.

Chaetotaxy of legs (trochanter-tibia): I 1-2-8-5-8 (Fig. 5A), II 1-2-5-4-5 (Fig. 5B), III 1-2-3-3-4 (Fig. 5C), IV 0-2-3-3-4 (Fig. 5D), all setae, except those that are spiniform, with numerous fine filaments (Fig. 5). Leg I (Fig. 5A) with the following arrangement of heavy spiniform setae: 2 ventral and 3 medial on telofemur, 1 medial and 1 much smaller ventral on genu, 1 ventral and 2 medial on tibia, 1 medial on tarsus, each spiniform seta with denticles apically, some of which are arranged in distinct rows. Setae of legs III and IV longer than those of

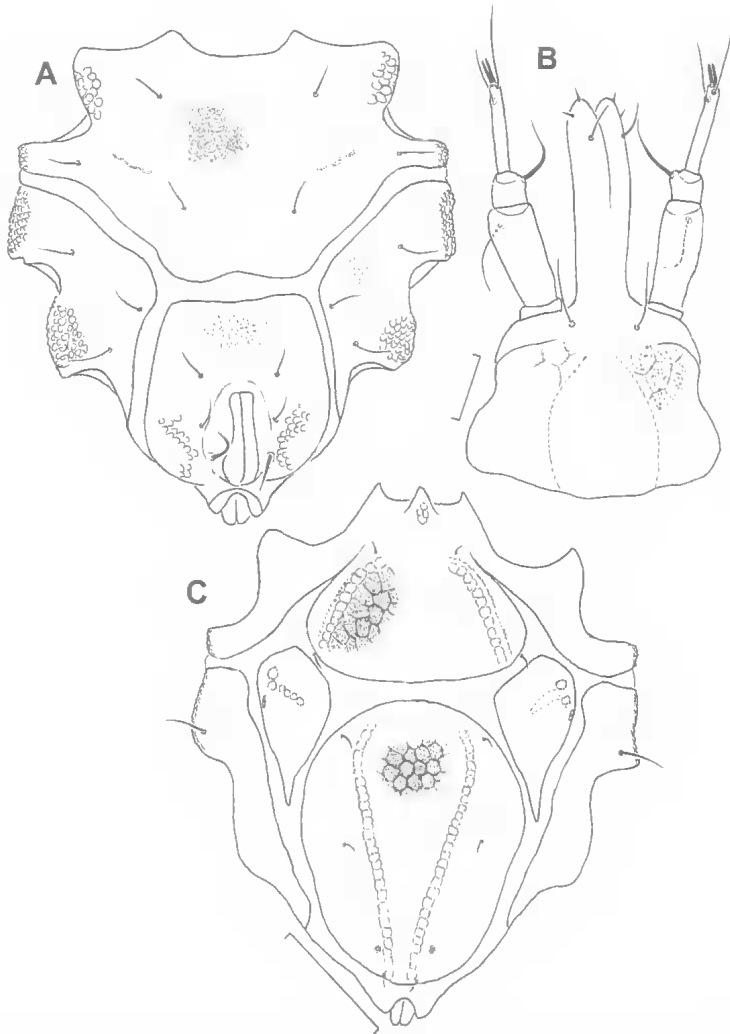


FIG. 4. *Agauopsis capillosa* sp. nov., adult: A, dorsal idiosoma of female; B, ventral idiosoma of female; C, ventral gnathosoma. Scale lines: A, B = 100 μ m; C = 25 μ m.

legs I and II. Tarsus I with pair of pas and pair of ventral setae; tarsus II with 1 pas laterally, without ventral setae; tarsi III and IV without pas or ventral setae. All tarsi with pair of smooth paired claws, those of leg I smaller than those of legs II-IV; median claw on tarsus I present, on other tarsi absent.

Male. Unknown.

REMARKS. In *Agauopsis capillosa* the apical palp segment is at least as long as palp segment P-2, which is known otherwise only for *A. okinavensis* Bartsch, 1986. *A. capillosa* differs from *A. okinavensis* in that the anterior epimeral

plate is not extending beyond the level at which legs III are inserted.

A. capillosa is most similar to *A. okinavensis*, previously the only known member of the *okinavensis* group (see Bartsch, 1986). Both species share a number of otherwise unusual characters on the basis of which *A. capillosa* is here assigned to the *okinavensis* group. These characters, which may be used to define this species group are: papillate areolae on anterior and posterior epimeral plates; narrow costae with quadrangular panels that are not pierced by canaliculi; projections lateral to the frontal spine; a very long palp tarsus with 2 filiform setae apically; a spine on palp segment P-3 that is at least twice as long as the segment; smooth claws on all tarsi and relatively long leg setae, in particular on legs III and IV.

Bartsch (1986) regarded the posteriorly extended anterior epimeral plate of *A. okinavensis* as a character by which the *okinavensis* group should be defined. However, the absence of this character in *A. capillosa* indicates that the extended plate is not a common character of species in this group.

Bartsch (1986) was uncertain whether or not to include *A. pteropes* Bartsch, 1986, in the *okinavensis* group and postponed the decision until further material was collected. I do not regard *A. pteropes* as a species of the *okinavensis* group since it lacks all of the aforementioned characters.

***Agauopsis decorata* sp. nov.**
(Fig. 6)

ETYMOLOGY. Latin, *decorata* = adorned; referring to the garland-like ornamentation of the anterior epimeral plate.

MATERIAL. HOLOTYPE: QMS105178, F, Great Barrier Reef Marine Park, Elizabeth Reef, 19°20.12'S

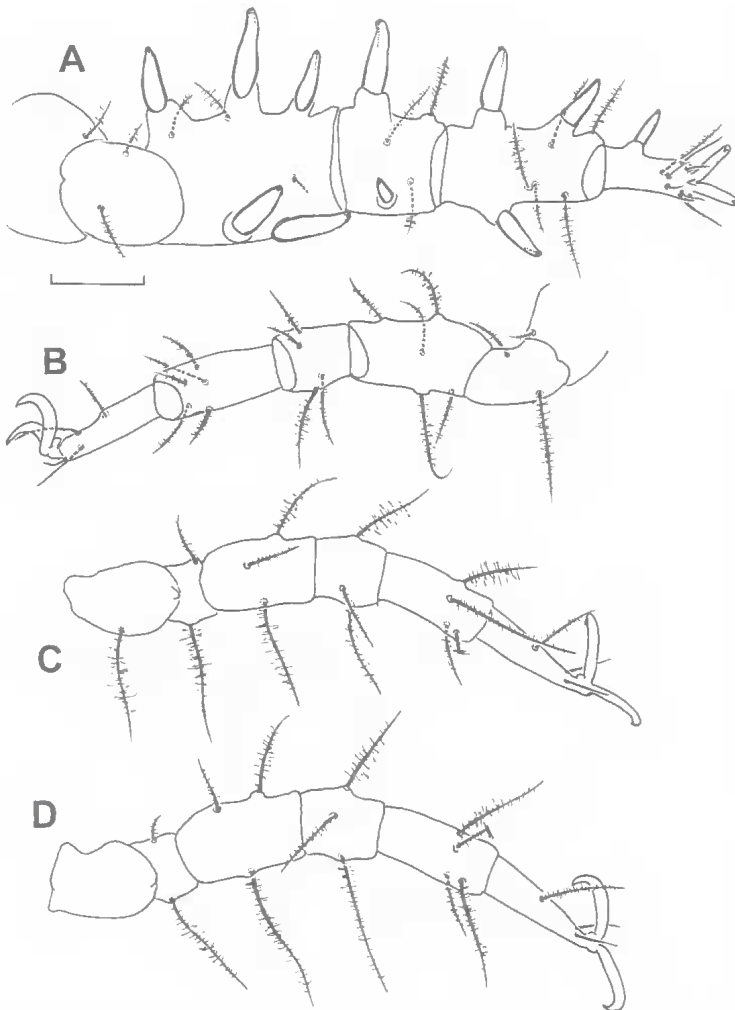


FIG. 5. *Agauopsis capillosa* sp. nov., adult: A, leg I, ventral; B, leg II; C, leg III, dorsal; D, leg IV, dorsal. Scale lines = 50 μ m.

149°02.85'E, 25 Dec. 1997, coral rubble at 10m. PARATYPES: Great Barrier Reef Marine Park: QMS105179, F, data as for holotype; QMS105180-105181, 2F, data as for holotype except: 24 Dec. 1997, coral rubble at 16-26m; QMS105187, F, Fantome I., 18°42.14'S 146°30.48'E, 6 Apr. 1998, coral rubble covered with mud; QMS105182, F, Fantome I., 18°42.11'S 146°31.51'E, 15 Apr. 1998, chunks of coral rubble at 2m; ANIC, F, Pandora Reef, 18°48.92'S 146°25.76'E, 22 Jan. 1998, chunks of coral rubble with rich epifauna/-flora, 0.5m; ZMH, F, Loadstone Reef, 18°42.03'S 147°06.54'E, 12 Apr. 1998, coral rubble at 12-15m; QMS105183, F, Townsville, Magnetic I., 16 Nov. 1996, sand at 2-6m; QMS105184, F, Bramble Reef, 18°25.25'S 146°40.65'E, 10 Apr. 1998, chunks of coral rubble at 3-6m; QMS105185, F, between Myrmidon and Faraday Reefs, 18°23.64'S 147°20.03'E, 13 Apr. 1998, fine-medium coarse sand at 51m;

QMS105186, F, No Name Reef, ca. 14°39'S 145°40'E, 9 Oct. 1998, chunky coral rubble and sand at 9m.

Female. Idiosoma 368-396 long (holotype 375). Outline as in Fig. 6A,B. Membranous cuticle between plates with only 1 pair of setae, situated on small platelets (Fig. 6A). AD with prominent pointed frontal spine; posterior to spine with slightly raised areola pierced by groups of canaliculi; laterally with pair of sharp dorsolaterally directed ridges, at their anterior end with pair of setae; along the inside of ridges with single row of rosettes of ca. 6-8 canaliculi, underneath each rosette in deeper cuticular layers an alveolus; part between ridges strongly elevated over lateral portions of plate, with cuticular bars forming reticulate ornamentation pattern, cuticle within each polygon pitted; posterior margin of plate almost straight. OC with 2 corneae, posterior to these an inconspicuous pore; transverse areola consisting of few canaliculi rosettes overlying an alveolus; areola and corneae on elevated part of plate; posterior part of plate with papillae forming an inconspicuous reticulate pattern. PD fused with anal cone; with pair of narrow, slightly raised costae consisting of single (in short sections doubled) row of canaliculi rosettes, underneath each rosette an alveolus; area between costae with conspicuous reticulate ornamentation, lateral to costae with papillae arranged in polygons and forming a less conspicuous reticulated pattern; anterior to anal cone with a transverse thickened areola, pierced by canaliculi rosettes and well separated from costae; with 1 pair of setae at anterolateral margin of PD, another pair approximately half way along PD, and a 3rd pair on anal cone. AE very faintly reticulate, over most parts with scattered canaliculi; rosettes of ca. 13-17 conspicuous canaliculi arranged to

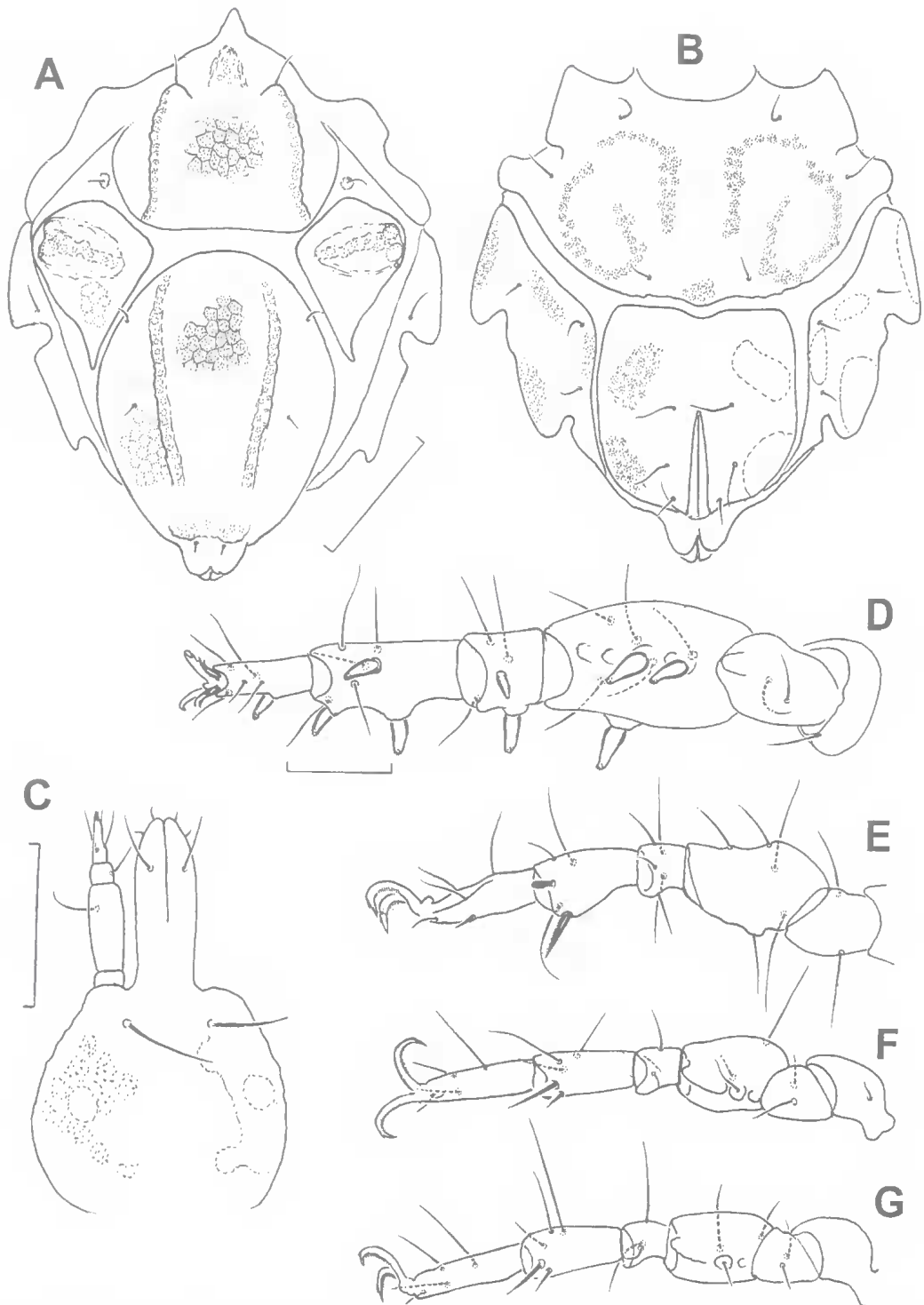


FIG. 6. *Agauopsis decorata* sp. nov., adult; A, dorsal idiosoma of female; B, ventral idiosoma of female; C, ventral gnathosoma; D, leg I, ventral; E, leg II, medial; F, leg III, ventrolateral; G, leg IV, ventrolateral. Scale lines: A, B = 100 μ m; C-G = 50 μ m.

form garland-like ornamentation pattern which is interrupted just posterolaterally of anterior pair of epimeral setae (Fig. 6B); posterior margin medially with bulged area containing an areola consisting of several canaliculi rosettes. PE ventrally with at least 4 areolae consisting of canaliculi rosettes. GA slightly indented anteriorly; 3 pairs of pgs positioned as in Fig. 6B, anteriormost pair level with anterior margin of GO; anterolaterally and posterolaterally with areola consisting of canaliculi groups and faint polygonal panels.

Ventral gnathosomal base laterally with pair of areolae consisting of few inconspicuous polygonal panels with canaliculi; circular scar on either side without canaliculi (Fig. 6C); between areolae pitted; anteriorly with pair of setae separated by $<1/2$ the width of gnathosomal base. Rostrum shorter than gnathosomal base. Palp with slender and tapering spine on P-3; P-4 with 2 setae in proximal half, both of subequal length.

Legs chaetotaxy (trochanters-tibia): I 1-2-8-5-8 (Fig. 6D), II 1-2-5-5-5 (Fig. 6E), III 1-2-3-3-5 (Fig. 6F), IV 0-2-3-3-5 (Fig. 6G). Leg I with the following set of heavy spiniform setae: 2 ventral and 1 anterior on basifemur, 1 ventral and 1 longer medial on genu, 1 ventral and 2 medial on tibia, 1 medial on tarsus, all with minute denticles at tip; basifemur I with distinct ventral protuberance (Fig. 6D). Tibiae II-IV with 1 ventral filiform seta on a protuberance, on tibiae III and IV flanked distally by a lamella and proximally by a second smaller protuberance; with pair of bipectinate setae, the shorter medial one clavate, the longer ventral one pointed. Tibiae III and IV with pair of slightly thickened and slightly denticulate setae, the lateral one longer than the medial one. Tarsus I with pair of double-pas and 2 ventral setae; tarsus II with 1 ventral seta and 1 lateral pas; tarsi III and IV with 1 medial pas. Paired claws on tarsus I smooth, without pecten or accessory process; claws of tarsi II-IV with pecten (more conspicuous on tarsus II than on tarsi III and IV) and inconspicuous accessory process. Median claw on tarsus I present, on II-IV absent.

Male. Unknown.

REMARKS. *Agauopsis decorata* sp. nov. belongs to the *ornata* group (see Bartsch, 1986, 1996a), which is common in tropical and subtropical waters but apparently absent in cooler regions (Bartsch, 1996a). Species of this group are recognisable by their garland-like ornamentation pattern on the anterior epimeral

plate. Other members of this group are *A. bacescui* Konnerth-Ionescu, 1977, *A. bermudensis* Bartsch and Iliff, 1985, *A. inflatus* Newell, 1984, *A. ornata* (Lohmann, 1893), *A. pseudoornata* Bartsch, 1985, and *A. ornatella* Bartsch, 1996a.

A. decorata differs from *A. bacescui* by having three instead of four spiniform setae on telofemur I, from *A. inflatus* by having a relatively shorter rostrum, from *A. bermudensis*, *A. ornata* and *A. pseudoornata* by having much narrower areolae and costae on AD and PD respectively, and from *A. ornatella* by having a raised areola posterior to the frontal spine.

***Agauopsis fenneri* sp. nov.**
(Figs 7,8)

ETYMOLOGY. In honour of Dr Doug Fenner, who collected the holotype.

MATERIAL. HOLOTYPE: QMS105188, F, Coral Sea, Lihou Reef NW, ca. 17°25'S 151°40'E, 22 July 1998, D. Fenner, sand at 8m. PARATYPES: Great Barrier Reef Marine Park: QMS105190, F, ANIC, F, ZMH. F, Lizard I., Coconut Beach, 13 Oct. 1998, medium coarse sand at 0.5m; QMS105189, M, QMS105191, F, Lizard I., Coconut Beach, 13 Oct. 1998, medium coarse sand at mid tide level, sediment depth 10cm.

Female. Idiosoma 327-341 long (holotype 333). Outline as in Fig. 7A,C. Membranous cuticle between plates with only 1 pair of setae, situated on small platelets anterior to OC (Fig. 7A). AD with prominent pointed frontal spine; posterolateral to spine with pair of conspicuous oblong roughened swellings which are pierced by few canaliculi; posterior to swellings with pair of sharp laterally directed ridges that carry at their anterior end a pair of setae; along the inside of ridges with single row of canaliculi rosettes, each overlying an alveolus; part between ridges strongly elevated over lateral parts of plate, with cuticular bars forming reticulate ornamentation pattern, cuticle within each polygon pitted; posterior margin of plate almost straight. OC with 2 corneae and small areola consisting of few canaliculi rosettes on elevated part of plate. PD fused with anal cone; pair of narrow costae consisting of double row of canaliculi rosettes each overlying an alveolus; area between costae elevated over remainder of plate, with cuticular bars forming conspicuous reticulate ornamentation similar to that of AD; just anterior to anal cone with transverse thickened areola, pierced by canaliculi rosettes, not distinctly separated from costae; 1 pair of setae at anterolateral margin of PD, another pair

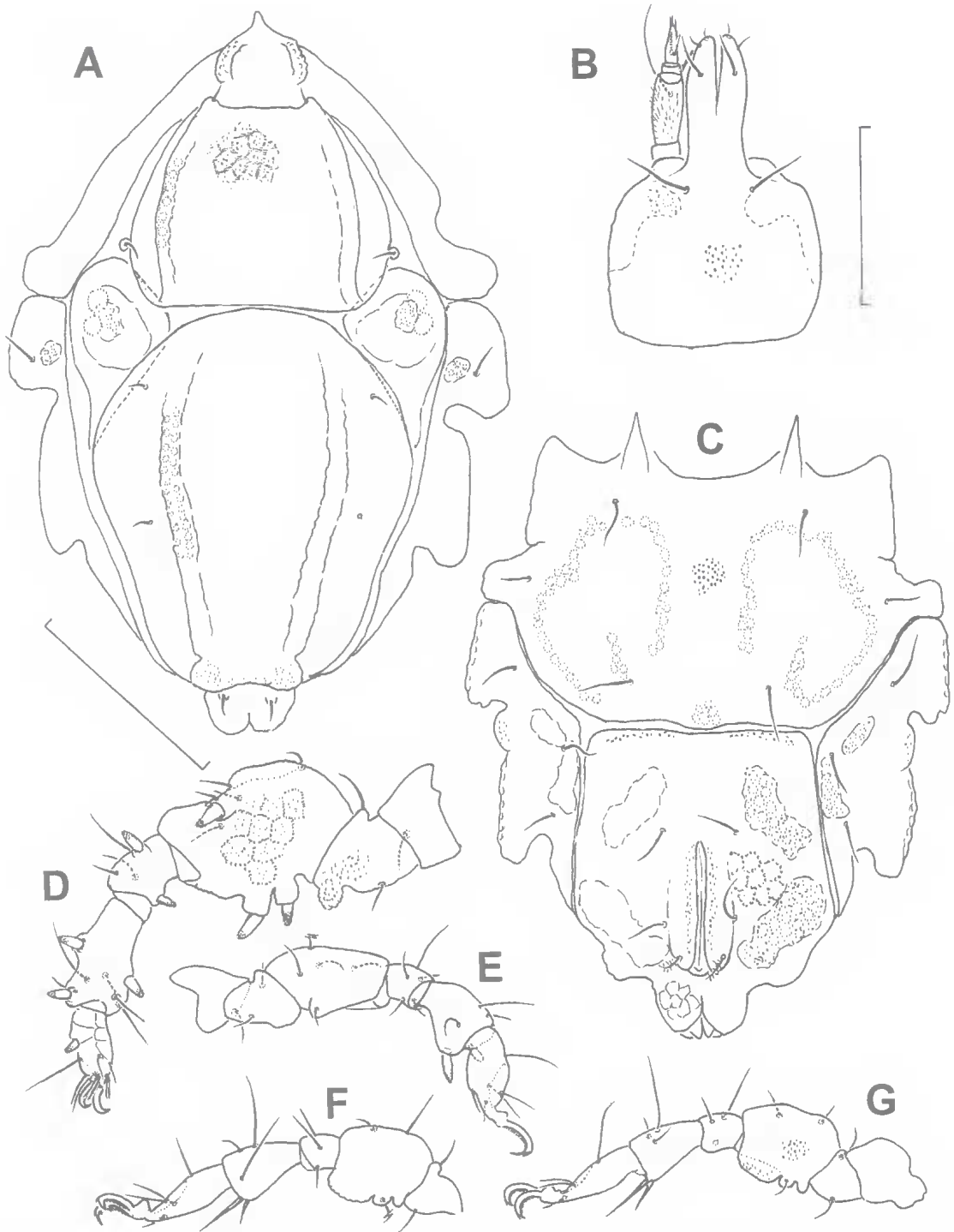


FIG. 7. *Agauopsis fenneri* sp. nov., female: A, idiosoma, dorsal; B, gnathosoma, ventral; C, idiosoma, ventral; D, leg I, ventromedial; E, leg II, lateral; F, leg III, lateral; G, leg IV, lateral. Scale lines: A = 100µm; B = 50µm; C-G = 100µm.



FIG. 8. *Agauopsis fenneri* sp. nov., genital opening of male. Scale line = 50 μ m.

approximately half way along PD, and a 3rd pair on anal cone. AE with canaliculi rosettes arranged to form garland-like ornamentation pattern; remainder of plate covered by shallow pits; posterior margin with a bulged area containing a single areola. PE ventrally with 2 areolae and dorsally with 1 areola close to dorsal seta. GA anteriorly with minute denticles; lateral to GO with 2 pairs of areolae consisting of canaliculi groups and faint polygonal panels; the the posteriormost pair of the 3 pairs of pgs covered with fine filaments; genital valves with a series of pits.

Ventral gnathosomal base pitted, lateral areolae pierced by canaliculi; anteriorly with pair of setae. Rostrum shorter than gnathosomal base. Palp segment P-2 with a cover of fine filaments. P-3 with well developed blunt and apically denticulate spine. P-4 with 2 equally long seta in proximal half.

Basifemur of leg I with distinct ventral protuberance. Telfemur I with distinct reticulation on both flanks; telfemora II-IV with reticulation only on medial flanks. Chaetotaxy (trochanters-tibia): I 1-2-8-5-8 (Fig. 7D), II 1-2-5-5-5 (Fig. 7E), III 1-2-3-3-5 (Fig. 7F), IV 0-2-3-3-5 (Fig. 7G). Leg I with the following set of heavy spiniform setae: 2 ventral and 1 anterior on basifemur (ventral ones on conspicuous protuberances), 1 short ventral and 1 longer medial on genu, 1 ventral and 2 medial on tibia, 1 medial on tarsus, all with minute denticles at tip. Tibiae II-IV with 1 ventral seta on protuberance, on tibiae III and IV flanked distally by a lamella and proximally by a second protuberance. Tibia I

with a heavy ventral denticulate seta and a wide but short bipectinate ventromedial seta; tibiae III and IV with pair of tapering spiniform setae. Tarsus I with 2 ventral setae and pair of double-pas. Tarsi II-IV without ventral setae, but with 1 lateral pas. Paired claws of tarsus I smooth, those of tarsi II-IV with pecten. Median claw on tarsus I present, on tarsi II-IV absent.

Male. Idiosoma 313-323 long. GO surrounded by ca. 16-18 apically branched pgs, inserted between callocities (Fig. 8). Five pairs of sgs, the posterior 3 pairs longer than the 2 anterior pairs.

REMARKS. *Agauopsis fenneri* sp. nov. belongs to the *ornata* group (see Bartsch, 1986, 1996a; remarks to *A. decorata*). Within this group the only other species that possesses a pair of oblong swellings posterolateral to the frontal spine is *A. ornatella* Bartsch 1996a. *Agauopsis fenneri* differs from *A. ornatella* in that the costae on the PD are 2 canaliculi rosettes wide and only 1 areola is present at the posterior margin of the AE (versus 2 areolae in *A. ornatella*).

Agauopsis narinosa sp. nov. (Figs 9,10)

ETYMOLOGY. Latin, *narinosa* = broadnosed; referring to the truncated frontal spine.

MATERIAL. HOLOTYPE: QMS105192, M, Great Barrier Reef Marine Park, Townsville, 16 Feb. 1997, algae on intertidal rocks. PARATYPES: Great Barrier Reef Marine Park: QMS105193, M, data as for holotype; ZMH, F, Cape Ferguson (S of Townsville), 19°16.09'S 147°03.05'E, 13 July 1997, algae on intertidal rocks.

Male. Idiosoma 340-350 long (holotype 340). Outline as in Fig. 9A,D. Membranous cuticle greatly reduced, without setae (Fig. 9A). AD with broad blunt frontal spine; posterior margin of plate convex; H-shaped raised areola ornamented with canaliculi groups, underneath each group an inconspicuous alveolus; areola 2 alveoli wide; posterior to transverse part of areola with reticulate ornamentation formed by cuticular bars surrounding coarsely pitted polygons; pair of setae inserted anteriorly; at anterior ends of areola with pair of inconspicuous pores. OC with 2 corneae; transverse areola 1-2 alveoli wide. Posterior to corneae with few canaliculi, pore not seen; corneae and areola elevated over remainder of plate; anterior to areola slightly roughened, posterior to areola with faint reticulated ornamentation. PD reticulated; with pair of prominent costae (Fig. 9A) carrying canaliculi groups and alveoli in deeper cuticular layers, costa 1-2 alveoli wide; 2 pairs of setae at

anterolateral margin; 3rd pair of setae at posterior margin. AE finely punctate, posterior margin slightly undulate (Fig. 9D). PE finely punctate, with areola posteriorly. GA finely punctate, lateral to GO with areola; cuticle around GO swollen. GO surrounded by ca. 12 pgs and pair of outlying setae arranged as illustrated (Fig. 9D).

Ventral gnathosomal base laterally punctate, along median axis smooth; pair of setae separated by $<1/2$ the width of gnathosomal base (Fig. 9B). Rostrum subequal in length to gnathosomal base. Palp segment P-3 with slender tapering spine; one of the 2 basal setae on P-4 only $1/5$ the length of the other.

Medial flanks of telofemur and tibia of leg I reticulated; telofemur I ventrally with conspicuous proximal protuberance. Tibia I apically with spine-like ventral lamella. Chaetotaxy (trochanter-tibiae): I 1-2-8-5-10 (Fig. 10A), II 1-2-6-5-6-5 (Fig. 10B); III 1-2-3-2-5-4 (Fig. 10C), IV 0-2-3-2-5-4 (Fig. 10D); Leg I with the following complement of heavy spiniform setae: 1 ventral and 2 medial on telofemur, 1 medial on genu I, 3 medial (2 of these closely associated) and 1 ventral on tibia, 1 medial on tarsus, all spiniform setae with small denticles apically; 2 spiniform denticulate setae ventrally on tibiae II-IV (Fig. 10B-D); 1 bipectinate seta medially on tibia II (Fig. 10B). The apical pair of the 3 dorsal fossary setae on tarsi III and IV branched (Fig. 10C,D). Paired claw of tarsus I with accessory process but no pecten, paired claws of tarsi II-IV with pecten and accessory process. All tarsi with median claw.

Female. Idiosoma 350 long. Three pairs of pgs inserted as illustrated (Fig. 9C); areolae posterolaterally to GO wider than in male.

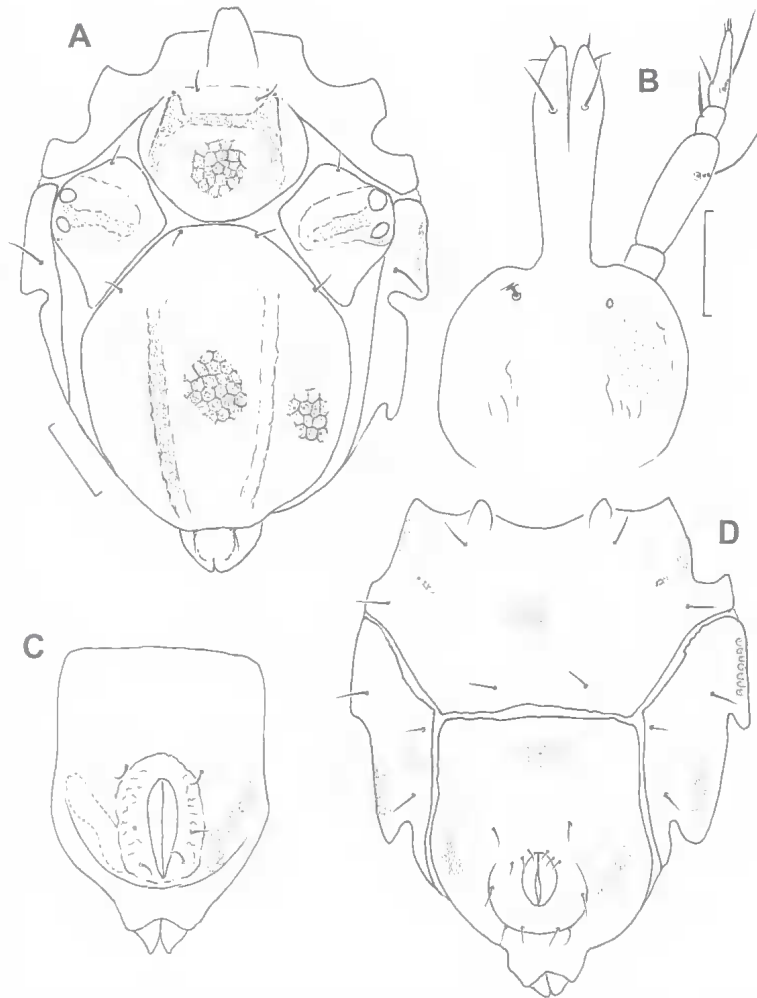


FIG. 9. *Agauopsis narinosa* sp. nov., adult: A, dorsal idiosoma; B, ventral gnathosoma; C, genitoanal plate of female; D, ventral idiosoma of male. Scale lines: A = 50µm, B = 25µm, C, D = 50µm.

REMARKS. *Agauopsis narinosa* sp. nov. belongs to the *microrhyncha* group (see Bartsch, 1986, 1996a). Species of this group can be recognised by the presence of 4 spiniform setae on tibia I, of which 2 are closely associated. Other species in that group are *A. antarctica* (Lohmann, 1907), *A. australiensis* Bartsch, 1996a, *A. crassipes* (Gimbel, 1920), *A. cryptorhyncha* (Trouessart, 1889a), *A. curvatus* Krantz, 1973, *A. felcis* Newell, 1984, *A. glacialis* Bartsch, 1993e, *A. humilis* Bartsch, 1992c, *A. insularis* Newell, 1984, *A. microrhyncha* (Trouessart, 1889b), *A. mokari* Otto, 1994, *A. paulensis* (Lohmann, 1907), *A. pusilla* Viets, 1950, *A. racki* Newell, 1984, *A. robusta* Sokolov, 1952, *A. similis*

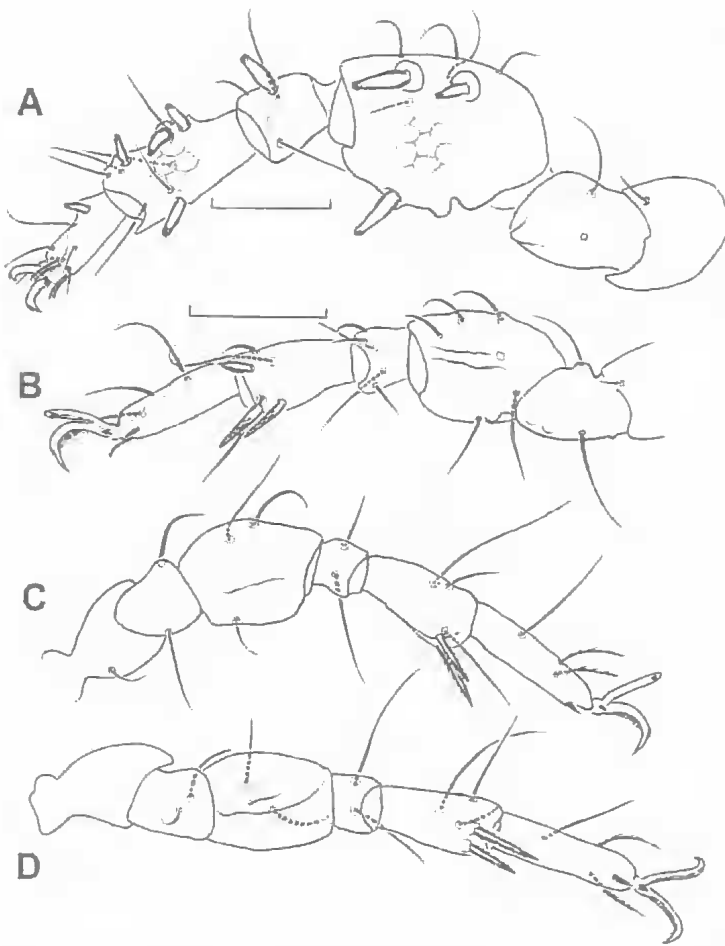


FIG. 10. *Agauopsis narinosa* sp. nov., adult: A, leg I, ventromedial; B, leg II, ventromedial; C, leg III, medial; D, leg IV, ventral. Scale lines =

Bartsch, 1979 and *A. viniae* Newell, 1984. In *A. narinosa* the frontal spine is conspicuously broad and truncated which among the species of the *microrhyncha* group is known only for *A. glacialis*. *Agauopsis narinosa* differs from *A. glacialis* by the narrower costae on the PD.

***Agauopsis okinavensis* Bartsch**
(Fig. 11)

Agauopsis okinavensis Bartsch, 1986: 169.

MATERIAL. Great Barrier Reef Marine Park: ANIC, F, John Brewer Reef, 18°38.25'S 147°04.42'E, 11 Apr. 1998, coarse sand at 15m; QMS105194, F, Myrindon Reef, back, 17°46.03'S 146°26.38'E, 6 Mar. 1998, L, Levantier, medium coarse sand at 7m; QMS105195, M, ZMH, M, Carter Reef, ca. 14.32°S 145.35°E, 11 Oct. 1998, coarse sand at 0.5m.

REMARKS. The specimens listed above are the first records of this species from Australia. It was previously known only from its type locality in Okinawa.

Bartsch (1986) described 1 pair of ventral setae on the posterior epimeral plate and did not see pores on the posterodorsal plate whereas in the Australian specimens 3 pairs of setae and a pair of pores are present at the corresponding locations. Unfortunately, I have been unable to examine the type, as the specimen could not be found in the United States National Museum where it had been deposited (R. Ochoa pers. comm.). However, the presence of only 1 pair of ventral setae on the posterior epimeral plate would be highly unusual (all species in the genus possess 3 pairs) and I therefore regard it as more likely that either further 2 pairs were broken off and the insertions were overlooked or that the holotype is an abnormal specimen. The apparent lack of pores on the posterodorsal plate is also not a distinguishing character as these pores are often obscured.

The present material contains previously unknown males which differ from the female as follows.

Male. Idiosoma 412-432 long. GO surrounded by 24-30 pgs inserted between cuticular swellings (Fig. 11); all pgs branched in distal half. Pair of outlying setae inserted anterolateral to GO. GO with 5 pairs sgs, 3 pairs anterior and 2 pairs posterior.

***Agauopsis ripa* sp. nov.**
(Figs 12,13)

ETYMOLOGY. Latin, *ripa* = coast, referring to the species' apparent restriction to coastal habitats.

MATERIAL. HOLOTYPE: QMS105196, M, Great Barrier Reef Marine Park, Toolakea Beach (near Townsville), ca. 19°09'S 146°35'E, 15 June 1997, algae and tubeworm colonies on boulders at low tide level. PARATYPES: Great Barrier Reef Marine Park: QMS105197-105200, 4F, ANIC



FIG. 11. *Agauopsis okinavensis* Bartsch, male: genitoanal plate. Scale line = 50 μ m.

M, ZMH M, data as for holotype; QMS105201, M, Townsville, Magnetic I., 16 Nov. 1996, algae at low tide; QMS105202, M, Cairns, Yorkeys Knob, 21 June 1997; QMS105204, F; QMS105203, M, Townsville, 17 Feb. 1997, intertidal algae on rocks; QMS105205, M, Townsville, 16 Feb. 1997, sediment between mangrove roots; QMS105206, M, Cape Ferguson (near Townsville), 19°16.09'S 147°03.05'E, 13 July 1997, algae on intertidal rocks; QMS105207-105209, 3M, Cape Hillsborough, 23 Dec. 1997, intertidal algae (mainly *Cladophora* sp.) around low tide mark. Southern Queensland: UQIC, M, 2F, Caloundra, Kings Beach, 20°00'S 148°16'E, 17 Aug. 1996, C.A. Bryant.

Male. Idiosoma 349-460 long (holotype 384). Three pairs of setae inserted in membranous cuticle between AD, OC and PD (Fig. 12A). AD rounded posterolaterally; frontal spine blunt and minute, in several specimens barely discernible; cuticle pierced by scattered canaliculi and with reticulate ornamentation; slightly raised H-shaped areola pierced by canaliculi which are wider than those of rest of plate; canaliculi within areola not forming distinct groups; at the end of the anterior arms of H-shaped areola with widely separated pair of setae and at same level with pair of inconspicuous gland-pores. OC with 2 corneae borne on elevated transverse areola; with conspicuous canaliculi similar to those on H-shaped areola of AD; posterior and anterior of areola with reticulate ornamentation and canaliculi similar to that on AD; pore just posterior to corneae at posterolateral margin of elevated areola. PD in most specimens slightly longer than wide, in some specimens length and width subequal; with pair of medial costae and pair of narrow marginal costae, each bearing canaliculi as described for AD; medial costae merging posteriorly to form 'U'; 1 pair of setae directly

lateral to medial costae, in some specimens inserted on anterior half of plate, in other specimens half way along plate; another pair of setae at posterior margin of plate; between costae with reticulate ornamentation and fine canaliculi as described for AD. AE with posterior margin slightly concave (Fig. 12D); very faintly reticulate and pierced by canaliculi which are distributed somewhat more densely than on dorsum. Ventral PE with anterior seta much longer than posterior one; pierced by canaliculi similar to those of AE. GA with variable anterior margin, in some specimens rounded (Fig. 12B) in others more truncate; pierced by canaliculi similar to AE; pgs forming 2 circles, inner circle with 9-19 setae, outer circle with 19-40 setae; 1 pair of outlying setae near anterolateral margin of plate; 5 pairs of short and thick sgs, 2 pairs anteriorly and 3 pairs posteriorly, middle pair of 3 posterior setae distinctly larger than other 2 pairs.

Venter of gnathosomal base with pair of widely separated setae anteriorly (Fig. 12B); pierced by canaliculi to level of setae, except for area along median axis; canaliculi in circular scar on either side finer than on remainder. Rostrum surpassing palps. Palp segment P-3 with truncate apically denticulate spine, that spine slightly longer than P-3.

All segments pierced by canaliculi. Leg I (Fig. 13A) slightly heavier but not distinctly longer than other legs (Fig. 13B-D), with the following complement of heavy spines: 2 ventral and 2 medial on telofemur (the 2 ventral ones closer together), 1 ventral and 1 medial on genu, 1 ventral and 2 medial on tibia, 1 medial on tarsus, all relatively short and denticulate in distal half. Chaetotaxy (trochanter-tibia): I 1-2-9-5-9 (Fig. 13A), II 1-2-6-5-7(8)-5 (Fig. 13B), III 1-2-3-3-5-3 (Fig. 13C), IV 0-2-3-3-5-3 (Fig. 13D); distalmost medial seta on tibia II blunt and slightly bipectinate (Fig. 13B); 2 ventral setae on tibiae II-IV spiniform and denticulate (Fig. 13B-D), one specimen with 3 such setae on tibia II; 1 medial seta on tibia II bipectinate. Tarsus I with 2 unpaired ventral setae and pair of doubled pas; tarsus II lacking ventral seta but with 1 spur-like medial pas, 1 lateral double-pas (ventral member of double-pas <1/2 the length of dorsal member). Tarsi III and IV with 1 spur-like lateral pas. Tarsal claws I smooth, without pecten or accessory process, claws II-IV with pecten and accessory process. Median claw on tarsus I bidentate, on tarsi II-IV absent.

Female. Idiosoma 369-440 long. Position of 3 pairs of pgs as in Fig. 12C. Sgs absent.

REMARKS. *Agauopsis ripa* sp. nov. belongs to the *brevipalpus* group (see Bartsch, 1986) which occurs in all oceans, in cold as well as warm water areas. Species of this group possess reticulated dorsal plates, often an H-shaped areola on the AD, 3 spines on the tibia of the front legs, usually 3 (sometimes 2) pairs of dorsal setae in the dorsal membranous cuticle and lack ventral setae on tarsus II. Within this group *A. moorea* Bartsch, 1992, *A. atacamae* Newell, 1984, *A. borealis* Newell, 1947, *A. brevipalpus* (Trouessart, 1889b), *A. ibssi* Bartsch, 1996d, *A. littoralis* Bartsch & Hiffe, 1985, and *A. sordida* Bartsch, 1992c, possess 4 spines on telofemur I. *Agauopsis ripa* is distinguished from *A. moorea* by having 6 instead of 5 setae on telofemur II, from *A. atacamae* by having a much wider PD, from *A. borealis* by having the setae on the AD more widely separated, from *A. littoralis* by having 2 instead of 3 denticulate spiniform setae on tibiae III and IV, from *A. ibssi* by the presence of distinct costae on the PD, from *A. brevipalpus* by the relatively shorter spines on leg I and from *A. sordida* by the relatively longer rostrum.

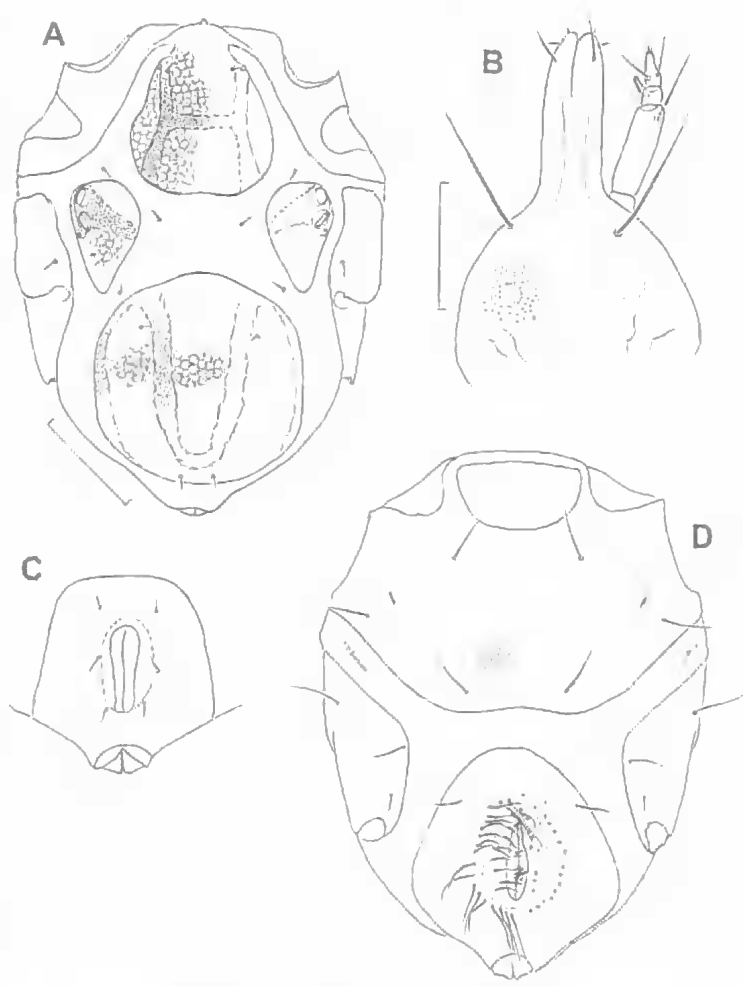


FIG. 12. *Agauopsis ripa* sp. nov., adult: A, dorsal idiosoma of male; B, ventral gnathosoma; C, genitalanalplate of female; D, ventral idiosoma of male. Scale lines: A = 100µm, B = 50µm, C, D = 100µm.

KEY TO NAMED AUSTRALIAN SPECIES OF AGAUOPSIS

The following key includes all named *Agauopsis* species known to occur in Australia. A further 2 unnamed species, one of these previously erroneously identified as *Agauopsis similis* Bartsch, 1979 (see Bartsch, 1996a) are here not included. Also excluded from this key are *Agauopsis brevipalpus* (Trouessart, 1889b) and *A. microrhyncha* (Trouessart, 1889b). Both species have been recorded by Lohmann (1893) from Australia but the record of the former is a misidentification (Bartsch, 1996a), while the record of the latter is believed to be a lapse (Bartsch, 1996a). However, it is yet unknown

whether the specimen Lohmann (1893) identified as *Agauopsis brevipalpus* is of an undescribed species or perhaps belongs to the Australian *Agauopsis ripa* sp. nov., which is very similar to *A. brevipalpus*.

1. Tibia I with 5 spines, 2 of these closely associated. AD as in Fig. 2A *A. henzi* sp. nov.
- Tibia I with 4 spines, 2 of these closely associated (Fig. 10A) 2
- Tibia I with 3 spines, none closely associated (Fig. 5A) 4
2. Anterior edge of frontal spine truncate (Fig. 9A) *A. narinosa* sp. nov.
- Frontal spine not distinctly truncate 3
3. Telofemur I with 4 heavy spines *A. mokari* Otto, 1994
- Telofemur I with 3 heavy spines *A. australiensis* Bartsch, 1996a
4. AE with garland-like ornamentation (Fig. 6B) 5

- AE without garland-like ornamentation 7
5. Posterior to frontal spine a porous areola (Fig. 6A).
 *A. decorata* sp. nov. 6
6. Costae on PD consisting of double row of rosette pores (Fig. 7A); 1 small areola medial at posterior margin of AE (Fig. 7C); spine on P-3 heavy and blunt, with few denticles at tip *A. jenniferi* sp. nov.
 Costae on PD consisting of single row of rosette pores; 2 small areolae medial at posterior margin of AE; spine on P-3 slender, tapering. *A. ornatella* Bartsch, 1996a 6
7. Palp segment P-4 as long as P-2 (Fig. 4B) 8
 Palp segment P-4 distinctly shorter than P-2 (Fig. 2D) 9
8. Anterior epimeral plate reaching level leg IV insertions *A. okinavensis* Bartsch, 1986
 Anterior epimeral plate reaching only level of leg III insertions (Fig. 4A) *A. capillosa* sp. nov. 9
9. PD with the 3 posterior pairs of setae much longer than anterior pair of seta *A. elaborata* Bartsch, 1996a
 PD with all setae of subequal length (Fig. 2A) 10
10. AD with pair of setae posterolaterally; membranous cuticle greatly reduced and without setae *A. aequilivestita* Bartsch, 1996a
 AD without a pair of setae posterolaterally; membranous cuticle fairly extensive and with three pairs of setae (Fig. 12A). 11
11. AD fused to AE anteriorly, with H-shaped areola (Fig. 12A); telofemur I with 4 heavy spiniform setae (Fig. 13A) *A. ripa* sp. nov.
 AD and AE separated by membranous cuticle, without H-shaped areola; telofemur I with 1 heavy spiniform seta *A. collaris* Otto, 1994 11

Halacaropsis Bartsch

Halacaropsis Bartsch, 1996a: 12.

TYPE SPECIES. *Agaua hirsuta* Trouessart, 1889b, by original designation.

DIAGNOSIS. Dorsal plates widely separated. Three pairs of dorsal setae inserted in striated integument, of these at least 2 much longer and heavier than the dorsal setae on AD and PD. Leg I with large spiniform setae on telofemur, genu, tibia and tarsus. Tarsi curved; with a heavy median claw. Tarsi III and IV each with 1 or 2 ventral setae.

Halacaropsis nereis sp. nov. (Figs 14, 15)

ETYMOLOGY. Greek, *nereis* = a sea-nymph.

MATERIAL. HOLOTYPE: QMS105211, F, Great Barrier Reef Marine Park, Townsville, 16 Feb. 1997, coralline algae at low tide mark. PARATYPES: Great Barrier Reef Marine Park: QMS105212, 105213, 105216, 3M, ANIC M, ZMH M, QMS105217, F, data as for holotype; QMS105262, F, Townsville, 17 Feb. 1997,

intertidal algae on rocks; QMS105263, 105214, 2F, QMS105264 M, Cairns, Yorkeys Knob, 21 June 1997, intertidal algae & mussels; QMS105265, F, QMS105210 M, Cape Hillsborough, 23 Dec. 1997, intertidal algae (mainly *Cladophora* sp.) around low tide mark.

Male. Idiosoma 555-648 long; all plates with smooth cerotegumental membrane; 3 setae in membranous cuticle much longer and heavier than other dorsal setae (Fig. 14A). AD and AE fused anteriorly; anterior margin with inconspicuous frontal spinelet; posterolateral part pierced by canaliculi; anterolaterally with pair of setae and pair of gland pores. OC distinctly longer than wide; anterolaterally with 2 corneae borne on slight elevation; pierced by canaliculi except for elevation and posterolateral margin; posterior to corneae a pore and a canaliculus. PD with 2 longitudinal areolae pierced by canaliculi; 1 pair of small setae in posterior half; posterior margin thickened medially. Adanal setae on anal cone. AE with 3 pairs ventral setae and pair of epimeral pores (Fig. 14E). GA with 2 circles of pgs, inner circle with ca. 10-12 setae, outer circle with ca. 33-39 setae; further pair of outlying setae near anterior margin of GA. GO with 5 pairs of peg-like sgs and 1 pair of heavier sgs with thickened base (Fig. 14D).

Ventral gnathosomal base smooth. Rostrum about as long as gnathosomal base (Fig. 14C). P-3 with apically denticulate spine; P-4 with 6 setae as illustrated (Fig. 14B).

Leg I with the following arrangement of heavy spiniform setae: I ventral and 2 medial on telofemur, I ventral and I larger medial on genu, 1 ventral and 2 medial on tibia, 1 medial on tarsus (Fig. 15A). Chaetotaxy (trochanter-tibia): I 1-3-8-9-11 (Fig. 15A), II 1-4-7-7-11 (Fig. 15C); III 3-2-5(4)-6-9 (Fig. 15D); IV 3-2-5-6-9 (Fig. 15F). Leg II with 2 denticulate spiniform setae (Fig. 15C), tibiae III and IV each with 1 such seta, proximal to these on tibiae III and IV with slightly thickened but smooth seta (Fig. 15 D, F, G). Paired claws on all tarsi smooth. Median claw on tarsus I slightly bidentate (Fig. 15B), on tarsi II-III unidentate (Fig. 15E); median claws of tarsi II-IV larger than those of tarsus I.

Female. Idiosoma 574-698 long (holotype 690). GO surrounded by 10-11 pgs (Fig. 14E); 5 pairs of small sgs.

Abnormalities. One of the legs I in some specimens has 4 spiniform setae on the tibia or 3 spiniform setae on the genu, while the other leg I in the same specimens showed the normal complement of spiniform setae.

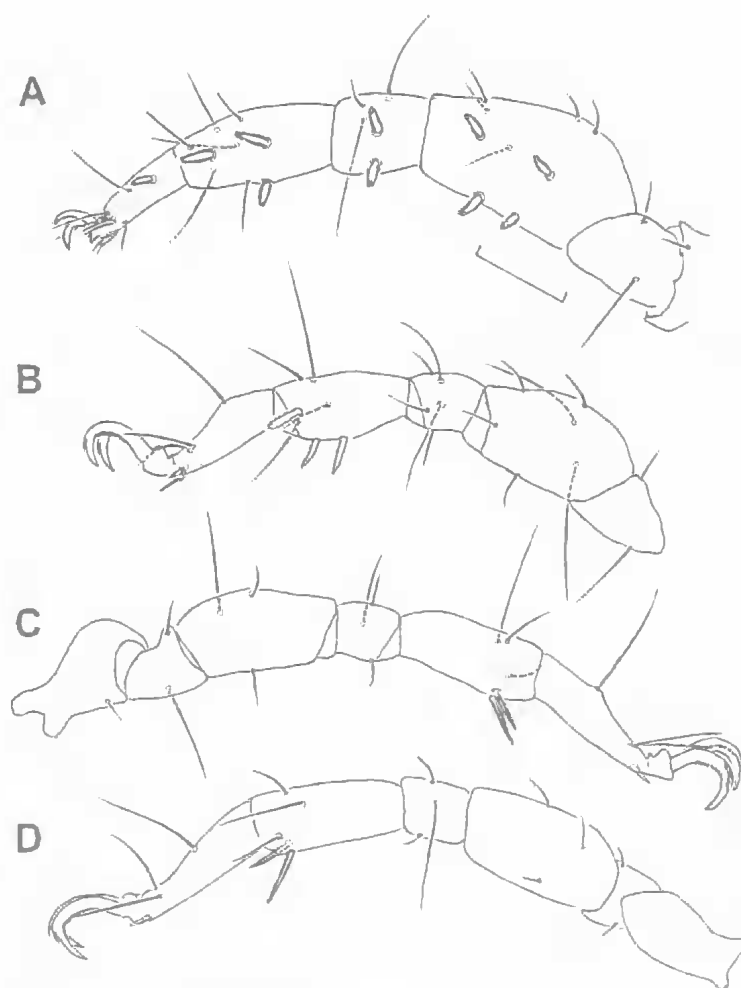


FIG. 13. *Agauopsis ripa* sp. nov., adult: A, leg I, medial; B, leg II, medial; C, leg III, medial; D, leg IV, medial. Scale lines = 50 μ m.

REMARKS. At present 4 other species of *Halacaropsis* are known: *H. capuzina* Bartsch, 1996a, *H. hirsuta* (Trouessart, 1889b), *H. warringa* Otto, 1993, and an unnamed species *Halacaropsis* sp. which was previously misidentified by Lohmann (1909) as *H. hirsuta* (see Bartsch 1996a). *Halacaropsis nereis* differs from its congeners by having smooth claws on all legs and a unidentate median claw on legs II-IV. It can also be distinguished from *H. warringa* and *H. capuzina* by having only 1 denticulate seta on tibia IV (versus 2 and 3 such setae in *H. warringa* and *H. capuzina* respectively) and from *Halacaropsis* sp. by having 3 pairs of heavy setae on the dorsum instead of 2 pairs (see Bartsch 1996a).

CONCLUSIONS

Of the 13 named and 2 unnamed species of *Agauopsis* which are certain to occur in Australian waters (excluding *Agauopsis brevivalpis* and *A. microhyncha*, see under 'Key to named Australian species'), 3 were only found on the temperate southeastern coast of Victoria and New South Wales (*A. collaris* Otto, 1994, *A. mokari* Otto, 1994 and *Agauopsis* sp. Bartsch, 1996a), 6 in the GBR region (those newly described in the present paper) and 4 only on Rottnest I. in SW Australia (*A. australiensis* Bartsch, 1996a, *A. elaborata* Bartsch, 1996a, *A. ornatella* Bartsch, 1996a and *Agauopsis* sp. Bartsch, 1996a). Similarly, each of these regions has their own species of *Halacaropsis*: *H. capuzina* Bartsch, 1996a on Rottnest I., *H. nereis* sp. nov. on the GBR and *H. warringa* Otto, 1993, in SE Australia. A fourth undescribed species of this genus previously identified by Lohmann (1909) as *Halacaropsis hirsuta* (see Bartsch, 1996a) was found at Shark Bay in Western Australia. Thus it appears that the halacarid fauna of each of

these regions is distinctly different from one another. However, 1 species (*A. aequilivestita*) occurs both on Rottnest I. as well as on the GBR indicating that some links exist between the fauna of both regions. It is yet unknown whether the species from the GBR also occur in neighbouring tropical regions as very little collecting has been done in the western part of the South Pacific. However, at least 1 species, *Agauopsis okinavensis*, is not endemic to the GBR region.

The genera *Agauopsis* and *Halacaropsis* only represent a small part of halacarid species usually found during surveys. For example, of 88 species found during a survey of Rottnest island only 5 belonged to the genus *Agauopsis* (Bartsch, 1996a), representing ca 5.7% of all halacarids described from the island. Projecting this number

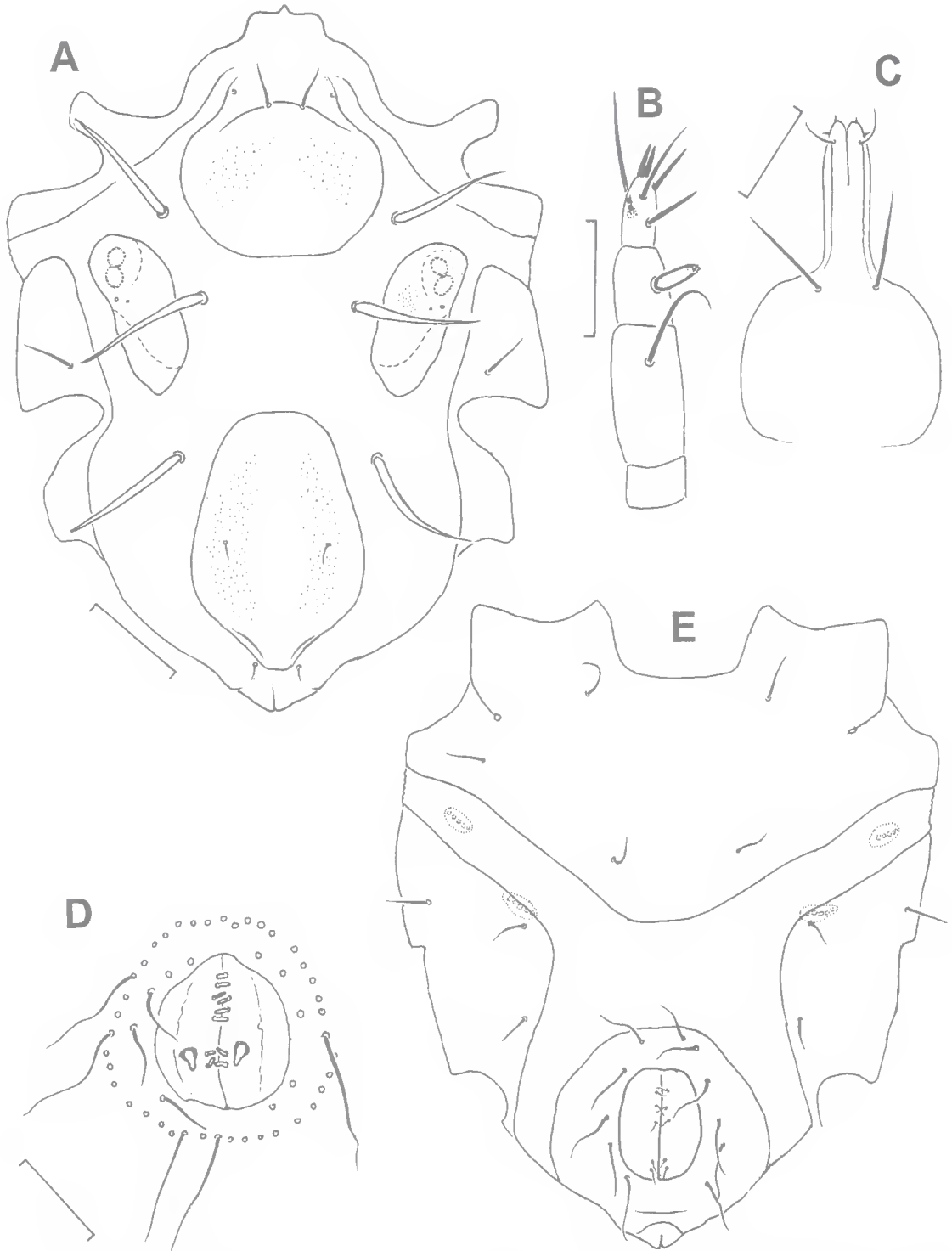


FIG. 14. *Halacaropsis nereis* sp. nov., adult: A, dorsal idiosoma; B, palp, dorsal; C, ventral gnathosomal base and rostrum; D, genital opening of male; E, ventral idiosoma of female. Scale lines: A = 100 μ m; B-D = 50 μ m; E = 100 μ m.

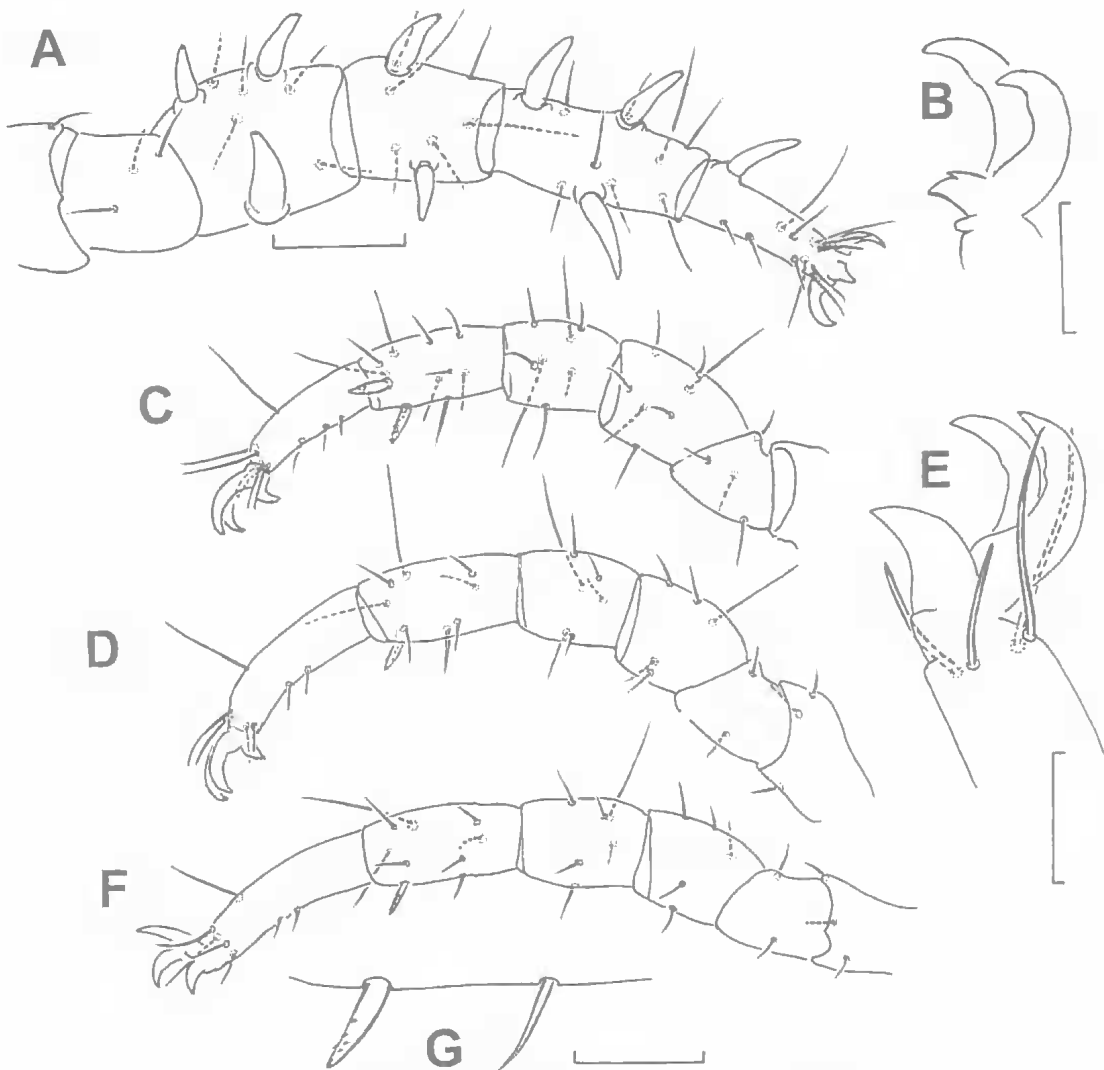


FIG. 15. *Halacaropsis nereis* sp. nov., adult: A, leg I, ventral; B, tarsal claws of leg I; C, leg II, medial; D, leg III, medial; E, tarsal claws of leg III; F, leg IV, lateral; G, enlarged aspect of ventral tibia IV. Scale lines: A,C,D,F = 100 μ m; B,E,G = 25 μ m.

onto the GBR region from where now 8 species of *Agauopsis* are known, and taking into account that only few parts of the region have yet been surveyed, it may be estimated that the total number of halacarid species in that area may easily exceed 140 species.

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